

## **Expand your research: Next-Gen Sequencing, Genotyping, Gene Expression, and Epigenetics at the Center for Medical Genomics at IUSM**

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The Center for Medical Genomics (CMG) provides Indiana researchers with next-generation sequencing, SNP genotyping, gene expression and epigenetics. We provide expertise in experimental design, carry out the procedures, and assist with analyses and interpretation. These state-of-the-art technologies have enabled a large number of grants to be funded over the years, and have resulted in a very large number of publications.

Our next-generation sequencing technology includes SOLiD5500xl, Ion Proton and Ion Torrent PGM (Personal Genome Machine). This set of instruments covers a wide range of next-generation sequencing capabilities from small bacterial genomes to the whole human genome, transcriptome (total RNA), small RNA, targeted DNA fragments, exome, ChIP-seq, and methyl-seq. We have generated sequencing data for 52 projects over the past two years.

Our SNP genotyping facility, using the Sequenom MassArray platform, specializes in targeted genotyping of 20-30 SNPs per assay and is an excellent choice for candidate gene studies and for following up results from GWAS and next-generation sequencing. It has been a central part of several large, multi-site collaborative genetic studies, including Genetics of Alcoholism (COGA), bipolar disorder, osteoporosis and hypertension, as well as many smaller projects; it is most efficient for sets of approximately 370 samples. We have produced more than 20 million targeted SNP genotypes to date. This platform is also capable of measuring allele-specific gene expression, and targeted quantitative DNA methylation for epigenetics study.

For many projects, microarrays offer a good alternative to next-generation sequencing for measuring gene expression. We use Affymetrix GeneChip microarrays, capable of measuring expression of nearly all genes in humans (and all exons within them), rats, mice and most model organisms, and can measure expression of miRNAs. We can also use RNA extracted from FFPE samples. We have carried out more than 6,700 GeneChip hybridizations to date in support of many different projects.

The CMG partners with the Center for Computational Biology and Bioinformatics for data analysis. We are recognized as a Core Facility of the Indiana CTSI and available to faculty not only from IU and IUPUI, but also from Purdue and Notre Dame Universities.